USACE - CESPK **June 25, 2014**

Sacramento River Bank Protection Project

Site Selection and Implementation Procedure for Bank Repairs

1.0 Introduction and Purpose

This memorandum documents the proposed site implementation procedure for bank repair under the Sacramento River Bank Protection Project (SRBPP). Currently there are 206[1] erosion sites identified (accounting for over 200,000 linear feet) in the Sacramento River Flood Control System (SRFCS). A procedure is needed to prioritize site repairs since it is not possible to design and construct repairs for all the sites within the current authorizations. The proposed procedure builds upon the existing site implementation practice which needed to be updated to adapt to new guidance and changing work environment. This document provides a general outline of the procedure and may not contain all the details. Many of these details will be worked out during the implementation process by the site implementation working group, which includes representatives from all the USACE's disciplines relative to this project. California Department of Water Resources (DWR) Real Estate will be included at the inception of the site selection process as the real estate component is a significant element of the implementation schedule. The unresolved details will be addressed in the future, but the team recommends the general process outlined in this document be adopted for future bank repairs.

This document and the flow chart in **Attachment A** describe the proposed procedure. This procedure was developed by the site implementation working group.

2.0 Background

The levees and banks of the Sacramento River and Tributaries have been repaired under the authority of the Sacramento River Bank Protection Project since the original authorization in 1960. The original authorization (Phase I) was for the repair of 435,000 linear feet. Phase II was authorized for an additional 405,000 linear feet in 1974. At this time, fewer than 3,000 linear feet from the Phase II authorization remain. In 2007, Water Resources Development Act amended the 1974 Phase II authorization to add an additional 80,000 linear feet. The procedure described in this memorandum is proposed to select sites for repair for the additional linear footage.

It is not clear how sites were chosen for repair after the original 1960 authorization. Following the 1996-1997 large flood events, which resulted in a levee breach and many flood fighting efforts throughout the system, the US Army Corps of Engineers (USACE) decided it needed to inventory all the erosion within the system to direct repairs towards the sites most in need of repair.

In 1997, the first annual erosion reconnaissance occurred and a list of erosion sites was developed. Every year thereafter a reconnaissance trip was performed to inventory all the new erosion sites and update the existing erosion sites. The number of erosion sites continued to grow at a steady pace.

[1] The 206 sites are based on the 2011 Annual Erosion Inventory Draft Report.

However the number of sites repaired declined to only 5 sites between 1998 and 2005. Bank repairs were limited during this time due to many factors, including funding, real estate, and concerns over the environment and endangered species. With the limited construction, the banks of the system continued to erode and many of the previously identified erosion sites became critical, meaning there was concern that a breach might occur from the next large flood event.

On February 24, 2006, following sustained heavy rainfall and runoff, Governor Arnold Schwarzenegger declared a State of Emergency for California's levee system. Following this declaration the USACE and the DWR repaired the critical erosion sites. Repairs of non-critical erosion sites continue, but with the backlog and new sites identified each year, the number of erosion sites is still outpacing the repairs.

In 2004, a set of four ranking methodologies were developed as part of the annual erosion inventory to assist with prioritizing and selecting bank repair sites. These methodologies have served the intended purpose, but a better procedure incorporating new guidance and addressing all disciplines was needed. This document outlines a new procedure that incorporates new guidance and addresses all disciplines.

3.0 Site Implementation Procedure

Listed below is the step-by-step procedure that the SRBPP is proposing in order to select erosion sites for repair. A flow chart of the steps and a timeline are provided as attachments.

3.1 Step 1 –Annual Reconnaissance/Erosion Inventory

The site implementation procedure begins with the erosion inventory reconnaissance. The erosion inventory consists of a visual reconnaissance of the levees and banks of the SRFCS by the Engineering Division of the USACE. The primary inspection method is by boat to have the best view of the levees and banks. However the entire system is not navigable, so some portions are inspected by car.

There are two parts to the erosion inventory; these two parts are typically referred to as the "annual erosion inventory" and the "extended erosion inventory". The annual erosion inventory includes the portions of the system that are inspected every year. This includes the reaches that convey flow through the system on an annual basis. The extended inventory is only inspected after high flow events or every five years. The extended erosion inventory includes portions of the system that either convey seasonal flow or do not typically convey flow on an annual basis, such as the bypasses. Table 1 shows reaches of the system inspected annually and inspected under the extended inventory, as well as the method of inspection.

During the reconnaissance trip, the team reviews the existing erosion sites, identifies new sites, and checks the previously repaired sites. Existing sites are checked for changes from the previous year, and checked for additional erosion or slumping, exposed tree roots, increased site length, changes in vegetation, changes in bank width or slope, or if the site is starting to heal (i.e. new deposition, or erosion has shifted to the opposite bank).

For new sites, in addition to the erosion details, basic information is collected, such as: location, berm width, bank slope, site length, soil material, erosion mechanism, revetment details, visible encroachments, and general notes. The site length is calculated with GPS points, but the berm width and bank slope are visually estimated using engineering judgment. Photo documentation is taken at each of the erosion sites.

Repaired sites are checked to make sure the repairs are still in good condition, no new erosion has formed at the upstream or downstream transitions, and for anything else of concern or significance. Sites repaired within the previous year are removed from the erosion inventory and moved to a revetment database. Occasionally a site will be removed from the erosion inventory based on more detailed information, changing site conditions (e.g. a site has changed from erosional to depositional and no longer qualifies), or a repair under a different program.

Table 1. Inspected Reaches of the Sacramento River Flood Control System

SRFCS Reach	River Miles or Length	Inspection Frequency	Inspection Method
American River	RM 0 - 13	Annual	Boat
Arcade Creek	2 miles	Extended	Car
Bear River	RM 0 - 14	Annual	Car
Best Slough	2 miles	Extended	Car
Butte Creek	15 miles	Annual	Car
Butte Slough	7 miles	Extended	Car
Cache Creek and Cache Creek Settling Basin	11 miles	Annual	Car
Cache Slough	14 miles	Annual	Boat
Cherokee Canal	20 miles	Extended	Car
Chico/Sycamore Creek	2 miles	Extended	Car
Colusa Basin Drainage Canal and Sycamore Slough	35 miles	Extended	Car
Colusa Weir Bypass	1 mile	Extended	Car
Coon Creek Interceptor	5 miles	Extended	Car
Cottonwood Creek	1 mile	Extended	Car
Deer Creek	5 miles	Extended	Car
Dry Creek (North)	9 miles	Extended	Car
Dry Creek (South)	2 miles	Extended	Car
East Interceptor Canal	3 miles	Extended	Car
Elder Creek	4 miles	Extended	Car
Elk Slough	9 miles	Annual	Boat
Feather River	RM 0 - 34	Annual	Boat
Feather River	RM 34 - 60	Extended	Car

Table 1. cont. Inspected Reaches of the Sacramento River Flood Control System

SRFCS Reach	River Miles or Length	Inspection Frequency	Inspection Method
Georgiana Slough	12 miles	Annual	Boat
Hass Slough	8 miles	Extended	Car
Honcut Creek	4 miles	Extended	Car
Jack Slough	6 miles	Extended	Car
Knights Landing Ridge Cut	6 miles	Extended	Car
Lindsey Slough	7 miles	Extended	Car
Marysville Ring Levee	7 miles	Extended	Car
Miner Slough	7 miles	Annual	Boat
Moulton Weir Bypass	2 miles	Extended	Car
Mud Creek	7 miles	Extended	Car
Natomas Cross Canal	5 miles	Extended	Car
Natomas East Main Drainage Canal	4 miles	Extended	Car
Pleasant Grove Canal	4 miles	Extended	Car
Putah Creek	9 miles	Extended	Car
Sacramento Bypass	2 miles	Extended	Car
Sacramento River	RM 3 - 196	Annual	Boat
Steamboat Slough	11 miles	Annual	Boat
Sutter Bypass	34 miles	Extended	Car
Sutter Slough	6 miles	Annual	Boat
Three Mile Slough	3 miles	Annual	Boat
Tisdale Weir Bypass	4 miles	Extended	Car
Ulatis Creek	4 miles	Extended	Car
Wadsworth Canal	5 miles	Extended	Car
West Interceptor Canal	2 miles	Extended	Car
Western Pacific Interceptor Canal	6 miles	Extended	Car
Willow Slough Bypass	8 miles	Extended	Car
Yankee Slough	4 miles	Extended	Car
Yolo Bypass	37 miles	Extended	Car
Yuba River	RM 0 - 5	Extended	Car

3.2 Step 2 – Critical and Non-Critical Erosion Site Decision

Decision step 2 of the site implementation procedure will identify critical erosion sites (if any) throughout the system and allow for an expedited path for the critical sites and a non-expedited path for non-critical sites. Critical sites are identified through engineering judgment based on

concern that a breach may occur from the next high flow event. The term "critical" refers only to the likelihood of a breach occurring and not the consequences of a breach. Therefore it is not a term that describes risk, which is comprised of both the likelihood of failure and the consequence of failure. Final selection of sites for repair includes both the likelihood of failure and the consequence of the failure. Therefore it is possible that critical sites may not be selected for repair if the consequences of failure do not justify construction in accordance with USACE policy. For example, if the site is deemed critical but is located in a basin that is not economically justified, the project will not select the site for repair.

Sites deemed critical and located in an economically justified basin as defined by the most current Economic Update will follow the path to Step 4 (Expedited). Step 3 (Expedited) is included in this path for site documentation purposes and will not delay the implementation process. Sites deemed critical which are not located in economically justified basins will be elevated to Corps management, and the Sponsor (DWR/CVFPB and Levee Maintaining Agencies) to determine alternative program or project authorities which can conduct the repair. After Step 4 (Expedited) economically justified critical sites will continue onto Step 5 (Expedited). Step 6 (Expedited) will be bypassed to avoid implementation delays and proceed to Step 7 (Expedited). Critical sites will be documented in an addendum to the lock-in list documentation and proceed onto decision point "Selected for Repair". At the "Selected for Repair" decision point, critical site will move forward to step 8. Non-critical sites will be selected based on available resources and prioritized based on their ranking from previous steps. The non-critical sites will proceed though the non-expedited steps that are further explained below and are shown in the attachment A flow chart.

3.3 Step 3 – Engineering Ranking and Report

The third step of the site implementation process is to develop a report and engineering site ranking based on the results of the information collected during the annual erosion reconnaissance. An aerial atlas will also be created which provides a visual representation of all the erosion sites in the system. The Engineering Ranking and Report occurs annually based on the annual field reconnaissance.

The site prioritization, or ranking, is based on engineering factors that contribute to levee breach or failure. These are site length, berm width, bank slope, soil type, velocity, erosion rate, and additional factors such as trees with exposed roots, holes, slumping, vertical sections, or cracks. Scores will be assigned to each factor to compile a total score, where the higher the score the worse the site and the higher priority for repair. There will be no tie breakers if two or more sites end up with the same score. The engineering score in the engineering ranking is essentially an estimate of the condition of a site relative to the other sites and is not a site implementation score. Site justification in step 4 and other opportunities and constraints identified in step 5 are critical for prioritizing and selecting sites for repair.

Once the report and atlas are finalized, the list of erosion sites will be provided to the Project Delivery Team. At this time the PDT[2] begins to perform preliminary research into the ownership of affected parcels. This will include researching encroachment permits and existing data sources to determine whether the existing real property rights in each parcel are held by the State entities through fee, easements, joint or common use agreements that can be utilized to affect repair.

3.4 Step 4 –Justification Screening

This step includes an economic analysis and any other work necessary to determine if repairing a site is justified using a risk based approach. While Step 3 looks only at the likelihood of breach, this step looks at the consequences as well. Unlike Step 3 Engineering and Ranking Report this step is anticipated to occur once every five years on average. However, if a new site is identified in an economic impact area that has not been analyzed previously a new justification analysis will be conducted to include this new repair site. The risk based justification screening will be based on erosion sites identified in the latest Engineering Ranking and Report from Step 3. Only repair sites located in justified basins will be repaired unless the repair site can be shown to be incrementally justified. Only justified sites will continue on to step 5.

3.5 Step 5 – Identify Opportunities and Constraints

During this step of the process we identify all the potential issues and opportunities associated with each site. This will address the following:

- Life Safety – Community and population considerations
- Real Estate – Right of Way issues, Easements, Encroachments, etc….
- Environmental – Affected habitat, mitigation requirements (onsite or offsite mitigation), listed species (Federal and State), re-establish habitat, etc….
- Constructability – What types of repairs are feasible or not possible, is there an opportunity to do a setback levee, etc…
- Cultural Resources – Identify historic and pre-historic properties
- Another Program/Agency is planning a repair
- Grouping of sites for more efficient repairs
- Other issues and opportunities – anything else that should be noted that could impact or enhance the repair
- USACE Guidance, Policies, and Budget

Under this step each USACE discipline in the PDT will identify any potential issues and opportunities which may affect, delay, or otherwise influence the repair of the site.

[2] The USACE real estate section and DWR real estate, along with a representative from the design team, are anticipated to be the PDT members performing the preliminary research into the ownership of affected parcels during step 3 after a process is developed for DWR real estate to be involved sooner than they currently are.

3.6 Step 6 – Conceptual Level Alternatives

Under step 6, the PDT will develop conceptual level designs and costs. For each site, multiple design alternatives will be generated based on engineering judgment. Conceptual cross sections and footprints will be generated. These will be based on the latest available topography. This topography may not match the present day bankline, so estimated present day banklines will be added to the sketch. Preliminary, simplified, cost estimates will be developed. These costs will be approximate based on engineering judgment.

3.7 Step 7 – Site Lock-in Procedure

Step 7 will select which of the non-critical sites will move on to the "lock-in" list for site repairs. The sites on the "lock-in" list are generally anticipated to be repaired over a three year period which makes up a construction cycle (see section 4.0 for more on construction cycles).This step will start with the engineering ranking developed in Step 3. Next the PDT[3] step will investigate all the issues identified in step 5 and see if any sites should be moved up or down in the ranking. For example, a site may be moved up if there is a justification for why a repair cannot wait or if a site is adjacent to a higher ranked site and the two sites could be repaired together. Another example could be a repair that is moved down on the list if there is a justification that the repair could cause more negative impacts than positive impacts. This step has an iterative component where conceptual level alternatives may be modified.

In addition, if another program, project, or entity is planning to repair an identified erosion site in the near future, the site will drop out of the locked-in list. However, the site will remain in the inventory until repaired.

The top identified sites will move on to Step 8 and be locked in, the remaining sites will continue to be evaluated in the annual erosion inventory and be considered for lock-in during the next cycle. If a site becomes critical (critical only in terms of likelihood of breach and not considering consequences) before the next site implementation cycle, then it may be fast-tracked to Step 8. If this occurs in the years between site selection cycles, an addendum to the latest Site Selection Lock-in List and Report will be prepared for these fast tracked critical erosion sites. A critical site that is fast tracked means it will be moved to construction as quickly as possible. However, construction could be delayed due to site-specific issues and the site may not be repaired for some time as a result. Sites identified as critical between site-lock in documentations will be added to the latest lock-in list documentation as an addendum. As noted previously, critical sites are identified in the annual Engineering Ranking and Report and considers likelihood of breach only and not the consequences of the breach.

3.8 Step 8 – Site Selection Lock-in List and Report

[3] This will include DWR Real Estate once the process to involve them earlier is established.

For step 8, the top sites chosen in step 7 and the fast-tracked critical sites will be considered the locked-in sites selected for repair in this construction cycle (see section 5.0 for information on construction cycles). The number of selected sites will vary depending on a number of factors, such as construction limitations (e.g. funding, location, length, etc.). A report will be written to document how and why the "locked-in" sites were selected for repair. This report will primarily be for USACE use and to keep a historical record of the process. The identified sites will be grouped into construction cycle-years, based on the required time needed to acquire real estate and similar construction repair methods or site proximity in order to enhance the value per dollar spent. See section 5.0 for information on construction phases within a construction cycle.

3.9 Step 9 – Data Collection

For this step the PDT will start collecting the data needed to develop the designs. The exact information and the level of detail collected at each site will vary from site to site. Some of the data to be collected includes topographic surveys, geotechnical explorations, tree inventory, potentially impacted endangered species and associated habitat, HTRW, cultural information, and utility survey.

Topographical surveys, including bathymetry of the underwater portion of the river, will be needed for each site. The topography should cover the entire project area, capture the landside toe, extend to cover the opposite bank, and extend far enough upstream and downstream of the site for the hydraulic modeling needs.

During the survey and follow-up activities, the design team will identify all existing visible encroachments on the levee that may interfere with proposed repairs, such as gas/oil pipelines, telecommunication lines, utilities, boat docks, stairs, intake and discharge facilities, and other improvements or structures. The design team will note if removal or relocation is the appropriate option for encroachments. Based on the data collected in the field, USACE real estate and DWR real estate will develop a timeline and process for an encroachment that needs to be removed or relocated[4].

Geotechnical data may be acquired if needed.

A tree survey will be completed to determine which trees will be protected and which trees will be removed. This survey will include tagging every tree in the project footprint as well as roughly 100 ft upstream and downstream of the footprint. The survey will also include a GPS point for each tree and a description of the type and condition (e.g. health, age, etc.) of the tree.

A survey and database search of all Federal and State listed species and associated habitats will be performed. This will include a survey of all threatened and endangered species, special status species, and sensitive habitat for fish, wildlife, and flora.

[4] This will include DWR Real Estate once the process to involve them earlier is established.

A Hazardous Toxic Radioactive Waste survey will determine if we have any environmental hazards.

Cultural resources surveys and database searches will be performed to identify any cultural resources located in each project footprint.

A real estate survey will be conducted to identify all potential impediments to securing the site for repair. This review will include an in-depth inspection of both the waterside and landside of the levee. It will be conducted jointly between USACE real estate personnel, DWR real estate personnel[5], and the responsible Reclamation District or Levee Maintaining Agency. A representative from the USACE design team and the DWR Flood Management personnel will join in the field review.

3.10 Step 10 – Preliminary Designs and Draft EA/IS

Step 10 will begin the design process and the draft EA/IS. The design alternatives will be selected and 30% designs (plans, specifications, and Design Document Report (DDR) and cost estimate will be completed. Following that, the hydraulic modeling will begin. District Quality Control, Agency Technical Review (ATR), and Independent External Peer Review (IEPR) reviews on the 30% designs will be conducted and the comments incorporated into the 60% designs. The DQC, ATR, and IEPR reviews will continue for subsequent designs such as 60% and 90%.

After the 60% designs, subject to USACE procedures, the construction footprints will be handed off to real estate to develop the take-letters for DWR Real Estate to begin the certification process. In addition, the sites will be grouped into cycle-years based on ability to acquire real estate and similar construction repair methods or site proximity in order to enhance the value per dollar spent. See also section 5.0 for information on construction cycles and phases. In general, it is anticipated that phase 1 will include higher priority sites with no significant issues that could delay construction, such as real estate issues. In general, it is anticipated that phase 3 will include lower priority sites and/or higher priority sites with issues that take longer to resolve, such as real estate issues. In general, it is anticipated phase 2 will include the remaining sites.

For example, phase 1 may include sites with existing rights and no encroachments (or encroachments that can be protected in-place), phase 2 may include sites without existing rights and no encroachments (or encroachments that can be protected in-place), and phase 3 may include sites without existing rights and encroachments or setback levee sites.

During this step, the draft Environmental Assessment/Impact Statement (EA/IS) will be developed and released for public review and comment for compliance under NEPA and CEQA. In conjunction with the EA, the cultural resources section will consult with the State Historic Preservation Office and the Native American Tribes.

[5] This will include DWR Real Estate once the process to involve them earlier is established.

3.11 Step 11 – Draft Final Design, Final EA/IS, and Pre-Construction Activities

Under this step the 60% Plans and Specifications will be reviewed, and the cost estimate updated. The team will finish writing the draft DDR. After an internal review of the plans, the 90% Plans and Specifications will be developed. The hydraulic modeling, cost estimate, and real estate requirements will be adjusted as needed. Following an internal review, the 90% Plans, Specifications, and DDR will be sent for reviews. The final EA/IS will be completed with signed Finding of No Significant Impact (FONSI) and Mitigated Negative Declaration (MND).

3.12 Step 12 – Review and Final Design

The official ATR and Independent External Peer Review (Type II IEPR, Safety Assurance Review (SAR)) will be performed throughout the development of the Plans and Specifications and the DDR. The ATR will serve as the Biddability, Constructability, Operability, Environmental, and Sustainability (BCOES) characteristics review of the plans, specifications, and EA/IS. Revisions to the designs and contract documents will be made based on these reviews, resulting in the 100% DDR and Plans and Specifications for Contract advertisement.

3.13 Step 13 – Contracting Procedure

For this step, USACE will compile the final plans and specifications, provide the signed BCOE, and process the funding element for construction. Real estate certification will be complete with a statement from DWR real estate and certification by USACE real estate. These items are provided to Contracting who then prepares the bid documents and solicits bids based on the chosen contracting vehicle. The contract is awarded and the chosen Contractor is given a Notice to Proceed.

3.14 Step 14 – Construction

For step 14, the contractor will construct the bank repair following the Notice to Proceed from step 13.

3.15 Step 15 – Mitigation Monitoring

On-site mitigation will require monitoring to ensure the establishment criteria is met for vegetation growth and survival. The monitoring period must be sufficient to demonstrate that the compensatory mitigation has met performance standards, but not less than five years (see 33 CFR 332.6(b)). Monitoring reports are required on a yearly basis. If the compensatory mitigation has met its performance standards in less than five years, the monitoring period length can be reduced, if there are at least two consecutive monitoring reports that demonstrate that success.

3.16 Step 16 – Site Turn-over

Once the construction and mitigation monitoring is complete, the USACE will turn the site over to the Central Valley Flood Protection Board, which will then turn the site over to the local maintaining agency. The USACE will provide the as-built drawings, Project Cooperation Agreement letter, and addendum to the supplemental O&M Manual, and letter of transmittal.

4.0 Economically Justified Basins Decision Point

As discussed in Step 3, all erosion sites will be documented in a report and ranked, but only the sites located in economically justified basin, as defined by the most current Economic Update will move to Step 5. Erosion sites not located in economically justified basins will be reconsidered in future economic updates (5 year construction cycle, or as additional data is obtained that warrant an earlier economic update using new methods that supersedes the 2011 Economic Update).

5.0 Construction Cycles

To implement the site implementation procedure, the process will be applied in a series of overlapping construction cycles. A single construction cycle is shown in the figure below and **Attachment B** shows a timeline illustrating the multiple overlapping construction cycles. The construction cycles are five years long, and includes three (3) years, or phases, of construction. The construction will be broken into these three phases (years) and the sites distributed among the three phases. The first year of the cycle produces the site lock-in list and data collection. The second year includes: 1) developing the preliminary plans, specifications, and DDR for all the sites in the construction cycle, 2) the EA/IS, and 3) the final plans, specifications, and DDR for the first construction phase. The third year will include the construction of the phase 1 sites and the final plans, specifications, and DDR of the phase 2 sites. The fourth year will include the construction of the phase 2 sites and the final plans, specifications, and DDR of the phase 3 sites. The fifth year will include the construction of the phase 3 sites. A new construction cycle will begin in Year 4 of the current cycle to ensure on-going construction. These overlapping cycles will allow SRBPP to continuously construct repairs every year assuming funding is available.

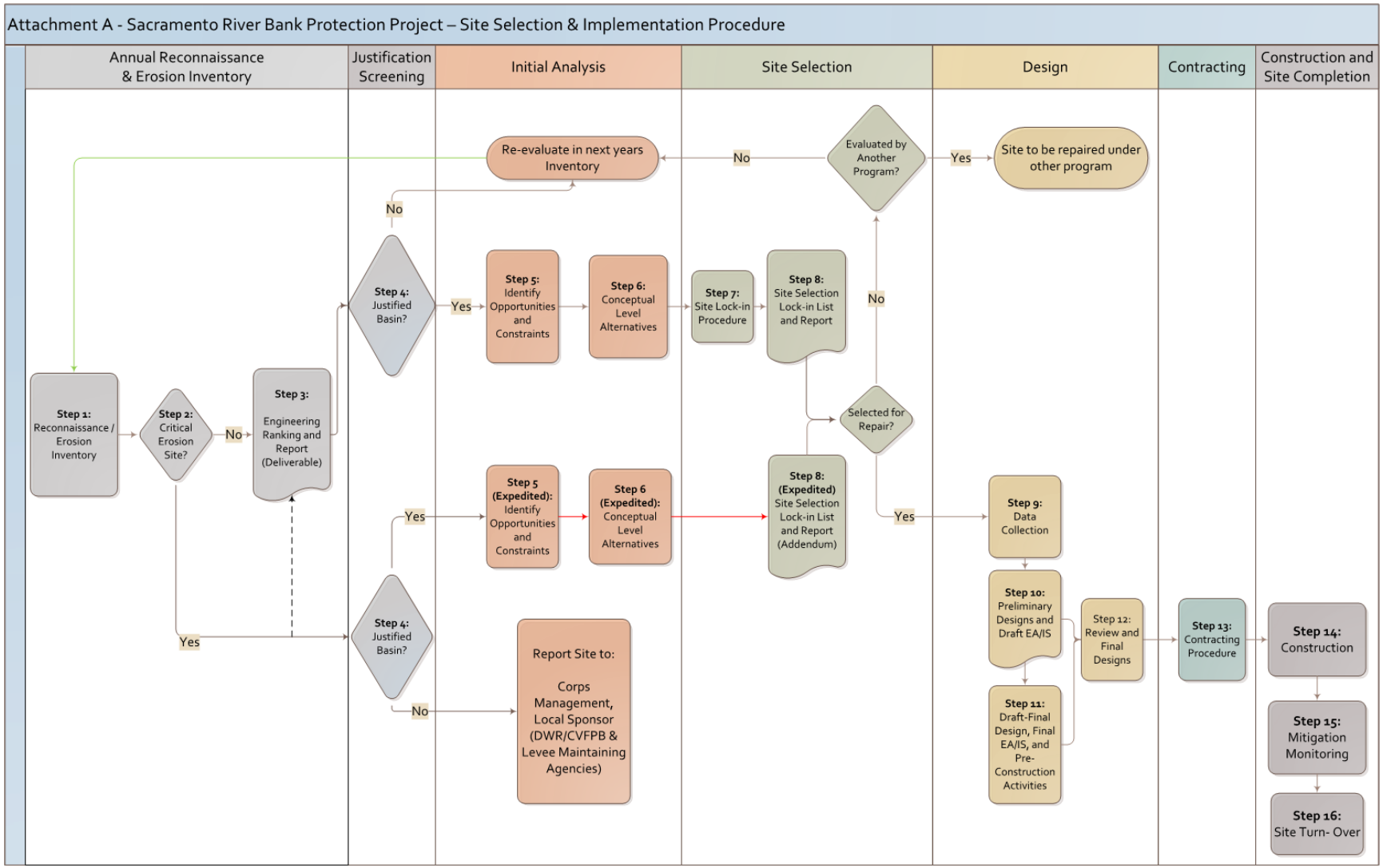
Construction Cycle 1				
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Site Lock-In List and Report Data Collection (Phase 1 - 3 Sites)	Preliminary Plans, Specifications, DDR, and EA/IS (Phase 1 - 3 Sites) Plans, Specifications, and DDR (Phase 1 Sites)	Construction (Phase 1 Sites) Plans, Specifications, and DDR (Phase 2 Sites)	Construction (Phase 2 Sites) Plans, Specifications, and DDR (Phase 3 Sites)	Construction (Phase 3 Sites)

6.0 Conclusion

New guidance and changing work environment requires the current site implementation practice to be updated. The site implementation working group developed and recommends the process outlined in this report. This process includes a site selection and implementation procedure that is applied in multiple construction cycles. Each construction cycle will last five (5) years and a new cycle begins in the fourth (4^{th}) year of the previous cycle. This process may need to be modified in the future to adapt and meet future changes to project requirements and conditions. However the team recommends adopting the general procedure outlined in this document for identifying and repairing erosion sites for the Sacramento River Bank Protection Project at this time.

Attachment A

Site Selection and Implementation Procedure Flow Chart


Attachment A - Sacramento River Bank Protection Project – Site Selection & Implementation Procedure
Annual Reconnaissance & Erosion Inventory
Justification Screening
Initial Analysis
Site Selection
Design
Contracting
Construction and Site Completion
Step 1: Reconnaissance / Erosion Inventory
Step 2: Critical Erosion Site?
No
Step 3: Engineering Ranking and Report (Deliverable)
Yes
Step 4: Justified Basin?
No
Re-evaluate in next years Inventory
Yes
Step 5: Identify Opportunities and Constraints
Step 6: Conceptual Level Alternatives
Step 7: Site Lock-in Procedure
Step 8: Site Selection Lock-in List and Report
Evaluated by Another Program?
No
Yes
Site to be repaired under other program
Selected for Repair?
No
Yes
Step 4: Justified Basin?
Yes
Step 5 (Expedited): Identify Opportunities and Constraints
Step 6 (Expedited): Conceptual Level Alternatives
Step 8: (Expedited) Site Selection Lock-in List and Report (Addendum)
Step 9: Data Collection
Step 10: Preliminary Designs and Draft EA/IS
Step 11: Draft-Final Design, Final EA/IS, and Pre-Construction Activities
Step 12: Review and Final Designs
No
Report Site to:
Corps Management, Local Sponsor (DWR/CVFPB & Levee Maintaining Agencies)
Step 13: Contracting Procedure
Step 14: Construction
Step 15: Mitigation Monitoring
Step 16: Site Turn- Over